

## CLAIMS

1. A routing table generating unit that generates a routing table describing a next hop to which a packet is to be sent according to a destination address of the packet that is input via an input channel, comprising
  - a ternary content addressable memory (TCAM);
  - an external memory;
  - a unit that classifies items in information that is received; and
  - a unit that stores an item that uniquely identifies the information among the classified items in the TCAM and stores the rest of the items to the external memory.
2. The routing table generating unit according to claim 1, further comprising:
  - a unit that, upon receiving new information, prior to storing the new information, searches the information stored in the TCAM using, as a search key, the item that uniquely identifies the information among the classified items;
  - a unit that initiates the storing process by the storing unit when the item that uniquely identifies the newly received information and the item that uniquely identifies the information that has been stored in the TCAM do not match in the search; and
  - a unit that, when the item that uniquely identifies the newly received information and the item that uniquely identifies the information that has been stored in the TCAM match in the search, determines whether the newly received information is older than corresponding information stored in the external memory that corresponds to the item that uniquely identifies the newly received information.
- 25 3. The routing table generating unit according to claim 2, further comprising:

a unit that ignores the newly received information, when it is determined by the comparing unit that the newly received information is as old as or older than the corresponding information stored in the external memory; and

5 a unit that, when it is determined by the comparing unit that the newly received information is newer than the corresponding information stored in the external memory, updates the corresponding information stored in the external memory with the newly received information.

4. The routing table generating unit according to claim 1, further comprising a unit  
10 that, upon an arrival of an arrived packet, searches for a shortest path using the information stored in the TCAM and the information stored in the external memory based on a destination address of the arrived packet.

5. The routing table generating unit according to claim 4, further comprising a unit  
15 that determines a next hop to which the arrived packet is to be sent based on the search of the shortest path.

6. A program used in a routing table generating unit that generates a routing table  
describing a next hop to which a packet is to be sent according to a destination address of  
20 the packet that is input via an input channel, the program, when installed in a computing device, providing the computing device with:

a function that classifies items in information that is received; and  
a function that stores an item that uniquely identifies the information among the classified items in a TCAM and stores the rest of the items in an external memory.

7. The program according to claim 6, further comprises:
  - a function that, upon receiving new information, prior to storing the new information, searches the information stored in the TCAM using, as a search key, the item that uniquely identifies the information among the classified items;
  - 5 a function that initiates the storing process by the storing function when the item that uniquely identifies the newly received information and the item that uniquely identifies the information that has been stored in the TCAM do not match in the search; and
  - a function that, when the item that uniquely identifies the newly received information and the item that uniquely identifies the information that has been stored in the TCAM match in the search, determines whether the newly received information is older than corresponding information stored in the external memory that corresponds to the item that uniquely identifies the newly received information.
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- 15 8. The program according to claim 7, further providing:
  - a function that ignores that newly received information, when it is determined by the comparing function that the newly received information is as old as or older than the corresponding information stored in the external memory; and
  - a function that, when it is determined by the comparing function that the newly received information is newer than the corresponding information stored in the external memory, updates the corresponding information stored in the external memory with the newly received information.
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9. The program according to claim 6, further providing a function that, upon an arrival of an arrived packet, searches for a shortest path using the information stored in
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the TCAM and the information stored in the external memory based on a destination address of the arrived packet.

10. The program according to claim 9, further providing a function that determines a

5 next hop to which the arrived packet is to be sent based on the search of the shortest path.

11. A recording medium readable from the computing device, which records the

program according to claim 6.

10 12. A link state database (LSDB) search unit that is provided in an interface that

processes a packet that is input via an input channel, provided in a packet transfer device, comprising:

a unit that collects received information using a control packet of a routing protocol;

15 a unit that stores at least a portion of items in the received information collected;

and

a unit that compares the stored information and information on the at least a portion of item in newly received information collected by the collecting unit to determine whether the newly received information is new or old.

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13. The LSDB search unit according to claim 12, further comprising a unit that,

upon an arrival of a newly arrived control packet containing the newly received

information, transfers the newly arrived control packet containing the newly received

information to a routing device when information on the at least a portion of item in the

25 newly received information is newer than the information stored based on the decision

made by the comparing unit, and discards the newly arrived control packet containing the newly received information when the information on the at least a portion of item in the newly received information is as old as or older than the information stored.

5 14. The LSDB search unit according to claim 13, further comprising a unit that transfers the information on the at least a portion of item in the control packet that has been transferred to the routing device to an LSDB search unit in another interface when the information on the at least a portion of item in the newly received information is newer than the information stored based on the decision made by the comparing unit.

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15. The LSDB search unit according to claim 14, further comprising:  
a unit that, upon an arrival of a newly arrived control packet containing the newly received information, transfers information on at least a portion of item in the newly arrived control packet containing a newly received information to an LSDB search  
15 unit in another interface when the information on the at least a portion of item in the newly received information is newer than the information stored based on the decision made by the comparing unit; and  
a unit that stores information on at least a portion of item in a control packet that is transferred from another unit.

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16. A program used in a link state database (LSDB) search unit that is provided in an interface that processes a packet that is input via an input channel, provided in a packet transfer device, the program, when installed in a computing device, providing the computing device with:

25 a function that collects received information using a control packet of a routing

protocol;

a function that stores at least a portion of the received information collected; and  
a function that compares the stored information and at least a portion of the  
newly received information collected by the collecting function to determine whether the  
5 received information is new or old.

17. The program according to claim 16, further providing a function that, upon an  
arrival of a newly arrived control packet containing the newly received information,  
transfers the newly arrived control packet containing the newly received information to a  
10 routing device when at least a portion of information in the newly received information is  
newer than the information stored based on the decision made by the comparing function,  
and discards the newly arrived control packet containing the newly received information  
when the at least a portion of information in the newly received information is as old as  
or older than the information stored.

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18. The program according to claim 17, further providing a function that transfers  
the at least a portion of the information in the control packet that has been transferred to  
the routing device to an LSDB search unit in another interface when the at least a portion  
of the information in the newly received information is newer than the information stored  
20 based on the decision made by the comparing function.

19. The program according to claim 18, further comprises:

a function that, upon an arrival of a newly arrived control packet containing the  
newly received information, transfers information on at least a portion of item in a newly  
25 arrived control packet containing the newly received information to an LSDB search unit

in another interface when the at least a portion of the information in the newly received information is newer than the information stored based on the decision made by the comparing function; and

- a function that stores information on at least a portion of item in a control packet
- 5 that is transferred from another function.

20. A recording medium readable from the computing device, which records the program according to claim 16.